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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,543	07/10/2003	Harvey Ellis Cline	124387	4286

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER

SRINIVAS, NIKHIL

ART UNIT PAPER NUMBER

3737

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/617,543	CLINE ET AL.	
	Examiner	Art Unit	
	Nikhil Srinivas	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/10/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3,6,7,9,10,11 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartzokis et al (U.S. Pat. 5,322,682) in view of Jesmanowicz et al. (U.S Pat. 5,603,322).

Regarding Claim 1, the Bartzokis reference discloses "a specific measure of iron stores in vivo using MRI. The T2 tissue in both lower to mid field strength MRI instruments and a higher field strength instrument is evaluated" (column 5, lines 6-13). The Bartzokis reference is lacking a tool used to acquire images by a pulse sequence, where as the Jesmanowicz reference discloses "a pulse sequence which is performed by an NMR system which acquires 128 images of the brain" (See Abstract). Also, the Jesmanowicz reference mentions that the region of interest is scanned by a sequence of NMR measurement cycles that vary accordingly depending on the volume of iron deposits. It would be obvious to one having an ordinary skill in the art to combine an image acquiring tool by pulse sequence, with the Bartzokis reference to provide a better method for iron detection in a selected region.

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Regarding claim 2, the Jesmanowicz reference lacks dual gradient pulse sequence where as the Bartzokis reference Figure 1 illustrates signal intensities of the two spin-echo sequences to produce gray scale encoded T2 maps of the brain. It would have been obvious to one having ordinary skill in the art to combine the dual echo sequencing with a pulse sequence image acquiring system that would provide a better analysis.

Regarding claims 3 & 13, the Jesmanowicz reference lacks a step that generates a 3 D field map of the brain whereas, the Bartzokis reference discloses, "a two dimensional or multidimensional map of the scanned tissue is constructed on the basis of T to visually identify different tissue types as being normal or abnormal "(column 5, lines16-18). It would have been obvious to one having ordinary skill in art to combine the pulse sequencing method of the Jesmanowicz reference (image acquisition by pulse sequence) with the Bartzokis reference to have a multidimensional map of the scanned tissue, which would eventually help in a better diagnosis.

Regarding claims 6 & 11, the Jesmanowicz reference lacks an indicative method that would suggest the presence of diseases like Alzheimer's, Parkinson's, Huntington and other neurodegenerative diseases. Where as the Bartzokis reference discloses "the accumulation of iron stores in tissue has been implicated in various neurological disorders such as Alzheimer's and Parkinsons disease" (column1, lines 20-24). It would have been obvious to one having an ordinary skill in the art at the time of the invention to combine iron detection methods as disclosed by Bartzokis with the pulse image sequencing of

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Jesmanowicz to provide an accurate iron detection that would help in the diagnosis of any neurodegenerative diseases.

Regarding Claims 7 & 10, the Bartzokis reference illustrates a graph showing the period T2 as measured in vitro against ferritin and apoferritin concentrations as measured in 1.5 and .5 Tesla fields (Figure 2). This clearly shows that tests were conducted at a strength of 1.5 Tesla and it is an obvious to use a higher magnetic field strength in order to detect iron deposits in a selected tissue.

Regarding claim 8, The Jesmanowicz reference lacks the repeating of the image acquiring steps in the tissue, whereas the Bartzokis reference discloses "the steps of measuring are repeated within a selected tissue region within the subject in order to obtain minimum statistical deviation of measurements within the tissue region" (column 3, lines 62-65).

It would have been obvious to one having ordinary skill in the art to repeat the steps of measurement within the selected region of interest to provide a better understanding of the disease and to monitor the progression.

Regarding claim 9, the Jesmanowicz reference illustrates an MRI device in Figure 1, the system shows the different components such as the CPU, pulse generator, controls, image processor etc. Where as the Bartzokis reference discloses a method for measuring iron stores in vivo using MRI, where it is processed through a 2D or a multidimensional map of the scanned tissue. It would be obvious to one having ordinary skill in the art to combine the system used in the Jesmanowicz reference with the methods of measuring iron as said

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in the Bartzokis reference to better monitor the selected region of interest of the brain.

Claims 4,5,14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartzokis et al (U.S. Pat. 5,322,682) in view of Jesmanowicz et al. (U.S Pat. 5,603,322) and in further view of Jesmanowicz et al. (U.S. Pat. 6,294,972).

Regarding claims 4 & 14, the Bartzokis and the Jesmanowicz (U.S Pat. 5,603,322) reference are lacking a field map of the brain using spherical harmonics where as the Jesmanowicz (U.S Pat. 6,294,972) discloses “ a local coil for acquiring NMR images of a selected part of a subject such as the human brain” (column 1, lines 10-12). Also, he states “ Magnetic fields may be represented in terms of an infinite series of orthogonal functions known as spherical harmonics. Each harmonic consists of the product of a field term and a source term. The field term determines the spatial variations of that harmonic and the source term defined its strength” (column 8, lines20-25). Additionally, the reference discloses “ In the preferred embodiment the field map is decomposed into 49 spherical harmonics” (column 8, lines 56-59). It would be obvious to one having an ordinary skill in the art to combine the method of spherical harmonics with the Bartzokis reference in order to enhance the image quality of the selected region of the tissue.

Regarding claims 5 & 15, the Bartzokis and the Jesmanowicz (U.S Pat. 5,603,322) reference are lacking variations in the magnetic field where as the Jesmanowicz (U.S Pat. 6,294,972) discloses “ Each harmonic consists of the

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product of a filed term and a source term. The filed term determines the spatial variation of that harmonic and the source term defined its strength" (Column 8, lines 22-24). Additionally, the reference states various harmonic source terms must be nulled to reduce the total field variations throughout the region of interest (Column 10, lines 45-55). It would be obvious to one having an ordinary skill in the art to subtract the spherical harmonic series to measure the variations of the magnetic field in the selected region.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikhil Srinivas whose telephone number is 571-272-6269. The examiner can normally be reached on Monday - Friday (8:30am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

N.S
9/27/2005


ALI IMAM
PRIMARY EXAMINER